Name: Date:

Polynomial Factoring solution (version 20)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 112}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-12}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 3}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{3}\, i}{2}$$

$$x = -5 \pm \sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 9i$ and $-7 - 5i$ in standard form $(a + bi)$.**

Solution

$$(2 - 9i) \cdot (-7 - 5i)$$

$$-14 - 10i + 63i + 45i^2$$

$$-14 - 10i + 63i - 45$$

$$-14 - 45 - 10i + 63i$$

$$-59 + 53i$$

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3. **Write function $f(x) = x^3 + 3x^2 - 13x - 15$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	3	-13	-15
-5		-5	10	15
	1	-2	-3	0

$$f(x) = (x + 5)(x^2 - 2x - 3)$$

$$f(x) = (x + 5)(x - 3)(x + 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 7) \cdot (x + 3)^2 \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.